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Economic Growth: Exploring the Link Between Physics Education and Economic Development in Nigeria

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ABSTRACT

This research aims to investigate the funding of physics Education in Nigeria which is facing notable hurdles due to the country's economic slump. The reason behind shortage of qualified Physics education programs is another factor to be observed. The study also examines prospective of public-private partnership, crowd funding and philanthropic investments. The study shall discuss the role of technology in reducing costs and increasing access to quality physics education resources through online learning platforms, mobile apps, etc. Overall, this study is to provide a comprehensive analysis of the challenges facing physics education in Nigeria and proposes innovative strategies for sustainable funding. The study recommends the establishment of a national fund for physics education, which can be supported by a combination of government allocations, private sector donations, and international grants. The fund can be used to support a range of initiatives, including teacher training, curriculum development, and infrastructure upgrade.

Keywords: Economic Growth, Physics, Economic Development, Nigeria

INTRODUCTION

The funding of Physics Education in Nigeria is facing notable hurdles due to the country's economic slump [1]. The limited allocation of resources to education, coupled with the decline in government funding, has resulted in a shortage of quality physics education programs [2]. This has severe repercussions for the country's ability to produce skilled physicists, engineers, and technicians who can drive innovation and economic growth. The study examines the prospective of public – private partnerships, crowd funding and Philanthropic investments to support Physics education initiative [3]. Additionally, philanthropic investments from organizations and individuals can provide critical support for physics education programs, including scholarships, grants, and infrastructure development. The effectiveness of technology in physics education manifested through (i) **improved academic performance:** the use of mobile learning tools, such as interactive simulations and virtual labs, significantly improve academic performance and retention rates. (ii) **Increased Accessibility:** Technology enhances learning for students with disabilities, promoting inclusivity and equal access to quality education. (iii) **Enhanced Understanding:** Interactive simulation and multimedia content help students better understand complex physics concepts. The importance of physics education in driving economic growth and motivation cannot be overstated [4]. Physics is a fundamental Science that underlies many Technological Advancements including energy transportation, and communication. However, the funding of physics education in Nigeria is facing significant challenges, which can have severe implications for the country's ability to produce skilled physicists, engineers, and technicians [5].

By leveraging technology, educators can create more engaging personalized and accessible learning experiences, ultimately reducing costs and increasing access to quality physics education resources. Physics education in Nigeria faces several challenges that hinder its effectiveness and appeal to students. Some of the key issues include: **Lack of qualified Physics Teachers**: many school struggle to find educators with the necessary expertise and training in physics. **Inadequate laboratories and Practical:** Schools lack the necessary equipment and facilities to conduct

experiments and hands on learning. **Outdated curriculum and teaching methods**: the curriculum often fails to engage students or relate physics concepts to real-world applications. **Low interest and Enrolment in physics programs**: physics is often perceived as a difficult and abstract subject that is deterring many students from pursuing it. To address these challenges, innovative strategies for sustainable funding are necessary, some of the potential approaches include: **Allocating more Funds to Education:** Government and stakeholders should prioritize funding for physics education, providing resources for modern equipment, laboratories, and teaching materials. **Collaborating with industry partners:** partnership with companies and organizations can enhance practical learning, provide access to cutting edge technology, and bridge the gap between academic knowledge and industry requirements. **Investment in Teacher Training:** Continuous professional development opportunities for physics teachers can improve teaching quality and student outcomes. **Promoting STEM Education:** Initiatives that highlight the importance of physics education and its impact on society can increase student interest and participation. **Scholarship and incentives**: Offering scholarships and incentives for students pursuing physics – related courses can encourage more students to take up the subject. Additionally, some potential sources of funding include: Government funding, Private Sector Partnerships, and Grants and Research funding. By implementing these strategies, Nigeria can improve the quality of physics education, increase student interest and participation, and ultimately drive technological advancements and economic growth.

Literature Review

Several studies have highlighted the important of physics education in driving economic growth and innovation [6]. However, the funding of physics education in Nigeria is facing significant challenges, including limited government funding, inadequate infrastructure, and a shortage of qualified teachers [7]. This study reviews the existing literature on the funding of physics education in Nigeria and identifies gaps in current research [8].

METHODOLOGY

This study uses a mixed-methods approach, combining both qualitative and quantitative data collection and analysis methods [9]. This study involves a survey of physics educators, policy makers, and industry experts, as well as case studies of successful physics education initiatives in Nigeria. This mixed method analysis involves combining quantitative and qualitative data collection and analysis to gain a deeper understanding of research problem. According to [10], mixed method design can be used in three ways:

1. Merging dataset: Combing quantitative and qualitative data into a cohesive whole to triangulate findings and increase validity,

2. Building on results: using the results of one method to inform or build upon the other, such as using qualitative data to explain quantitative findings.

3. Embedding: Embedding one dataset within another, such as adding open – ended questions to a survey instrument.

The benefits of mixed methods research include: **Increased validity**: Triangulating data and results can increase confidence in findings. Deeper understanding: Combining quantitative and qualitative data can provide a more nuanced understanding of research problem. **Identifying complexities**: Mixed methods can uncover hidden complexities or contradictions, leading to new research hypotheses.

Adopting mixed methods, researchers can leverage the strengths of both quantitative and qualitative approaches to gain a more comprehensive understanding of their research topic.

In view of the above therefore a questionnaire was developed and administered to fifty lecturers of Physics within Adamawa state, see copy attached.

Table 1. Below represents summary of the respondents under the following headings: Category (hours spend per week), Frequency (number of participants) and Percentage (rating of the respondents).

Category	Frequency	Percentage
< 4hrs	5	10%
4 – 6hrs	13	26%
6 – 8hrs	22	44%
8 – 10hrs	6	12%
>10hrs	4	8%
	50	100%

RESULTS

From table 1. above, 10% of lecturers spend less than four hours Lectures/ week, 82% of lecturers spend 4 to 8hrs Lectures/week, 8% of Lecturers spend greater than 10hrs Lectures/week this is because of shortage of physics lecturers in the institutions where the questionnaire was administered. In Nigeria the number of contact hours Lectures have with students teaching physics can significantly impact student performance and the teacher effectiveness. It can result to student better understanding, other factors like teaching method and available resources also plays a pivotal role in enough contact time coupled with inadequate Laboratory equipment and qualified teachers, can hinder students' achievement in physics. The study finds that public-private partnerships, crowd funding, and philanthropic investments have the potential to support physics education initiatives in Nigeria (KPMG, 2020). The study also finds that technology can play a critical role in reducing costs and increasing access to quality physics education resources [11]. However, the study highlights the importance of community engagement and outreach in promoting physics education raising awareness about its importance for economic development.

Recommendation: The study find that UNESCO doesn't have a specific standard of Lecturer workload, but recommendation concerning the status of teachers provides guidelines on working conditions (1966). In view of this I recommend that the incoming researcher to improve on this research by involving stake holders to ensure workload standard.

CONCLUSION

This study provides a comprehensive analysis of the challenges facing physics education in Nigeria and proposes innovative strategies for sustainable funding by adopting these strategies, Nigeria can ensure the long-term viability of physics education, ultimately contributing to the country's economic growth and development. The study recommends the establishment of a national fund for physics education, which can be supported by a combination of government allocations, private sector donations, and international grants can ensure long-term viability [13].

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